

CLAIMS

1. A refractory coating composition for coating high temperature substrates, said composition comprising:
 - 5 unstabilized zirconia; and
 - silica.
2. The composition of claim 1 wherein said unstabilized zirconia is present in an amount of about 50 to about 90 parts per hundred of said composition.
- 10 3. The composition of claim 1 wherein said silica is present in an amount of about 10 to about 50 parts per hundred of said composition.
4. The composition of claim 1 further including zircon.
5. The composition of claim 4 wherein said zircon is present in an amount of up to 100 parts per hundred of said composition.
- 15 6. The composition of claim 1 further including an inorganic filler.
7. The composition of claim 6 wherein said filler is mullite.
8. The composition of claim 7 wherein said mullite is present in an amount of up to about 50 parts per hundred of said composition.
9. The composition of claim 1 wherein said unstabilized zirconia and said
- 20 silica are present in a weight ratio of about 9:1 to about 1:1.
10. The composition of claim 1 wherein the composition is for coating substrates at temperatures greater than about 1100°C.
11. A refractory coating composition comprising:
 - about 15 to about 75 parts per hundred unstabilized zirconia;
 - 25 about 5 to about 25 parts per hundred silica; and
 - up to about 100 parts per hundred zircon.
12. The composition of claim 11 further including an inorganic filler.
13. The composition of claim 12 wherein said filler is mullite.
14. The composition of claim 13 wherein said mullite is present in an
- 30 amount of up to about 50.0 parts per hundred of said composition.

15. The composition of claim 11 wherein the composition is applied to a ceramic substrate.
16. The composition of claim 11 wherein the composition is applied as a slurry.
- 5 17. The composition of claim 11 wherein the composition is applied as a decal on a substrate.
18. The composition of claim 11 wherein the composition is applied as a thin film having a thickness of about 20 to about 500 microns.
19. A ceramic sintered member comprising:
 - 10 a ceramic body; and
a refractory coating formed on a surface of said ceramic body, said refractory coating comprising:
 - unstabilized zirconia;
 - silica; and
 - 15 zircon,
- wherein said refractory coating maintains stability at temperatures in excess of about 1100°C.²⁰ The member of claim 19 wherein said refractory coating further includes mullite.
21. The member of claim 19 wherein said refractory coating formed on a²⁰ surface of said ceramic body has a thickness of about 20 to about 500 microns.
22. The member of claim 19 wherein said refractory coating further includes a mullite.
23. The member of claim 19 wherein said ceramic body comprises silicon carbide or silicon nitride.
- 25 24. The member of claim 19 wherein said ceramic body and said refractory coating are different colors such that said refractory coating provides a marking on said ceramic body.
25. A method of making a ceramic sintered body comprising the steps of:
 - providing a ceramic substrate;
 - 30 providing a refractory coating composition comprising:
 - unstabilized zirconia;

silica; and

zircon;

applying the refractory coating composition on the ceramic substrate; and exposing the coated ceramic substrate to sintering conditions;

5 wherein the refractory coating on the ceramic substrate maintains stability at temperatures greater than about 1100°C.

26. The method of claim 25 wherein the ceramic substrate comprises silicon carbide or silicon nitride.

27. The method of claim 25 wherein the coating composition further 10 includes mullite.

28. The method of claim 27 wherein the mullite is present in an amount of up to about 50 parts per hundred.

29. The method of claim 25 wherein the coating composition comprises about 50 to about 90 parts per hundred unstabilized zirconia; about 10 to 15 about 50 parts per hundred silica; and up to about 100 parts per hundred zircon.

30. The method of claim 25 wherein the refractory coating composition is applied at a thickness of about 20 to about 500 microns.

31. The method of claim 25 wherein the refractory coating composition is 20 applied to a portion of the ceramic substrate.

32. The method of claim 25 wherein the refractory coating composition and the ceramic substrate are different colors and the composition is applied to a portion of the ceramic substrate as a marker.

33. The method of claim 25 wherein the refractory coating composition is 25 painted onto the ceramic substrate.

34. The method of claim 25 wherein the refractory coating composition is spray coated onto the ceramic substrate.

35. The method of claim 25 wherein the refractory coating composition is sponged onto the ceramic substrate.

30 36. The method of claim 25 wherein the refractory coating composition is brush coated onto the ceramic substrate.

37. The method of claim 25 wherein the refractory coating composition is screen printed onto the ceramic substrate.